

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Art Unit : 2875
Examiner : Gunyoung T. Lee
Applicant : David J. Alessio
Appln. No. : 10/518,219
Filing Date : December 16, 2004
Confirmation No. : 5728
For : LED LIGHTING DEVICE

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

DECLARATION UNDER 37 C.F.R. § 1.131

I, the undersigned, declare as follows:

1. I am the inventor of the invention defined in all of the claims of the above-identified patent application.
2. Prior to December 31, 2001, I conceived of the invention as defined in claims 1-16. Evidence of my conception is provided in the form of a drawing (copy attached as Exhibit A) that I prepared following my conception. The mechanical drawings were prepared before December 31, 2001 as stated in the Idea Disclosure Form attached as Exhibit B.
3. Prior to December 31, 2001, I also reduced to practice the invention as defined in claims 1-16 by making a prototype of the device, from which the drawings of Exhibit A referenced in (2) above were made. Evidence of my reduction to practice is provided in the statement in the Idea

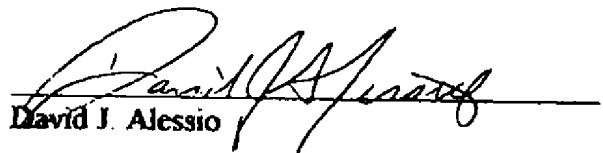
Applicants : Dale A. Flanery et al
Appln. No. : 10/789,204
Page : 2

Disclosure Form of Exhibit B referenced in (2) above which states that first samples were made in October 2001.

4. All of the above activities outlined above occurred in the United States.

The undersigned hereby declares that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

By:


David J. Alessio

8/17/06
Dated

EXHIBIT A

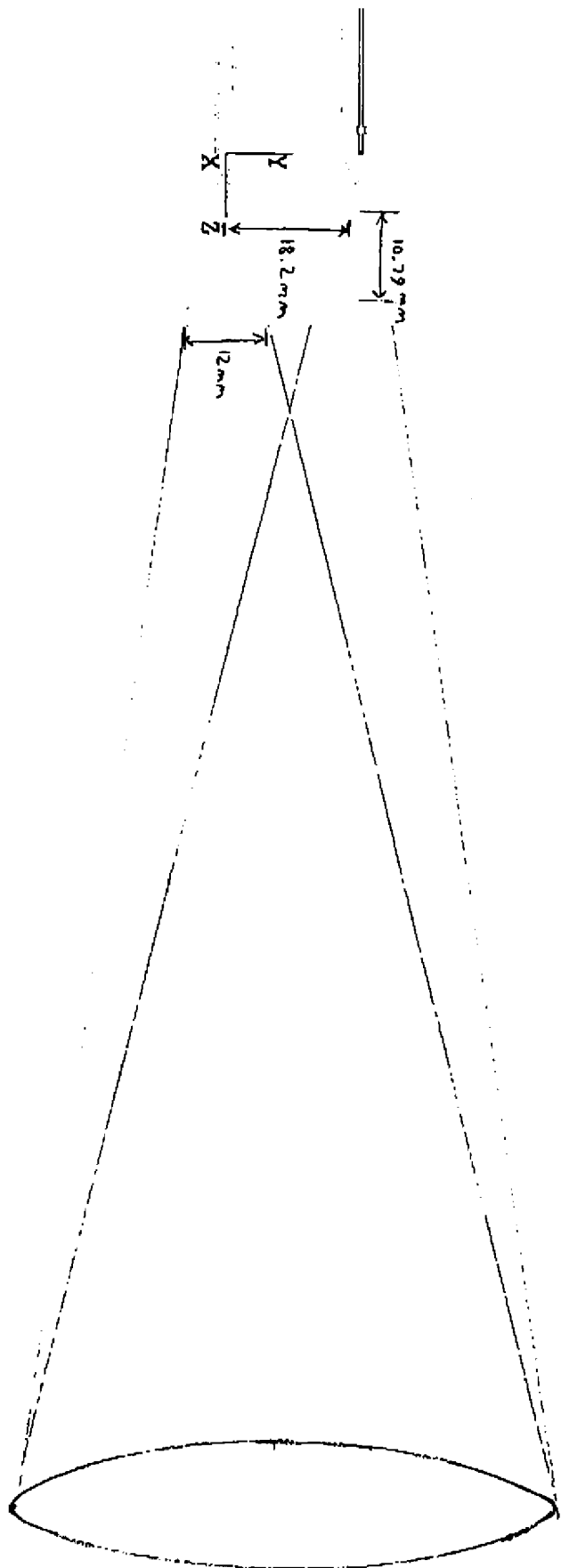


EXHIBIT B

LEGAL
CONFIDENTIAL

IDEA DISCLOSURE FORM
EVEREADY BATTERY COMPANY
Location: Westlake Room C15

CASE
NUMBER

SP-1598

INSTRUCTIONS: THIS IS A PROTECTED DOCUMENT. BEFORE FILLING IN THE FORM, SAVE IT (TO DISK) AS A WORD DOCUMENT. YOU WILL ONLY BE ABLE TO TYPE IN THE UNPROTECTED AREAS. USE ← AND → KEYS TO MOVE FROM ONE UNPROTECTED AREA TO ANOTHER. FOLLOW THE INSTRUCTIONS FOR EACH SECTION. ALL SIGNATURES SHOULD BE IN INDELIBLE BLUE INK. WHEN THE FORM HAS BEEN COMPLETED, SIGNED AND DATED, SUBMIT THE ORIGINAL SIGNED COPY TO THE INTELLECTUAL PROPERTY LIAISON. EACH CONTRIBUTOR MAY KEEP A PHOTOCOPY FOR THEIR FILES.

SECTION I Type the requested information in the shaded boxes; leave the box blank if there is no information.

Title: Multiple LED/Magnifier System

Date Idea First Disclosed: October 2001
Idea First Disclosed To: Joe Gardner
Idea First Disclosed By: David Alessio
Where Idea First Recorded: Westlake Lighting Products Technology Lab

Date Sketches/Drawings First Made: December 2001
First Sketches/Drawings Made By: David Alessio
Where First Sketches/Drawings Recorded: TracePro files
Date First Samples Made: October 2001
First Samples Made By: David Alessio

SECTION II Answer each question based on the information now available; if no information is available, skip that question. If additional documents (e.g., drawings, IR's, etc.) are needed or desired, reference them under the appropriate question(s), and indicate page number, paragraph number, etc., where the pertinent information is located if appropriate.

What was the problem or deficiency?

The best white LED on the market is rated at 3.6V, 30mA, and produces less than 4 lumens of light. An incandescent lamp with a similar voltage rating will produce anywhere from 7 to 42 lumens, depending on whether vacuum, krypton, or halogen is used. One solution to the low light output problem is to use multiple LED's. Many companies are currently using in the range of 4 to 10 LED's per device, but this can be very expensive. In addition, this solution offers very poor efficiency since much of the light can be considered stray light that never reaches the intended target.

Why was the problem/deficiency addressed?

LED's offer many advantages over incandescent lamps. LED's are very durable, they have a lamp life in the 100,000 hour range, and they operate at low current drains, which equates to

extended battery life. The disadvantages are cost and light output. If the light output of the LED could be addressed, we could capitalize on the many advantages that the LED has to offer.

Describe the idea.

The specific idea presented here uses two Nichia white LED's in combination with two double convex magnifiers. The LED's are spaced 18.2mm apart. A glass (SF5) double convex magnifier, 12mm in diameter with a 12mm effective focal length, is placed over each LED. Each magnifier is positioned orthogonal to the axis of the LED. The axes of the LED's are parallel to one another. The distance between the tip of the LED and the surface of the lens should allow for a back focal length of 10.79mm. (This is the distance between the source of light within the LED and the surface of the lens) The spot produced from one LED/magnifier combination will overlap with the other to produce one circular spot with uniform intensity. See attached drawing.

How are the new findings better than those previously known for solving the same problem?

Previous methods used to solve the light output problem with LED's are expensive and inefficient. The optical system described above minimizes cost and maximizes efficiency.

What is the best way to practice the invention? (Include examples and, if appropriate, sketches).

The optical system must be designed in such a way as to allow the spot produced by each individual LED/magnifier to precisely overlap with adjacent LED/magnifiers. The result is a single spot of sufficient intensity, excellent symmetry, and uniform intensity.

How can the preferred principle or method of operation be altered and extended without losing the advantages of the invention?

The number of LED/magnifier combinations can be changed, depending on the intensity needed for the application. The dimensions of the lenses can be altered, depending on the spot diameter needed for the application. The type of lens can be changed from double convex to plano convex. The lens material can be glass, or polymer.

Describe the contribution of each individual identified below as a contributor.

David Alessio – Optical research and development using TracePro, as well as the sample model development.

Has there been a plan, or have any plans been made, (a) to use the idea in production or distribution of samples, (b) to publish the idea or (c) to sell the idea or something that contains or was made using the idea? If so, give dates and other details.

This system was designed to be used in the new Energizer headlight that is due to be released later this year.

What prior literature or patents are the contributing individuals aware of in the area of the idea?

I am not aware of any patents in the area of this idea.

Estimated increase in battery performance, e.g. percent increase in high rate, ANSI performance?

This optical system is designed to maximize the usability of the light emitted from a multiple LED source. I estimate that the percent increase in beam intensity when the optical system is used is about 200%.

SECTION III Type the name of each contributor, one to a shaded box. When the form is completed, print it. Each contributor should sign and date the form under their printed name in indelible blue ink. A witness should print their name in the space provided, then sign and date in indelible blue ink below their printed name.

INDIVIDUALS CONTRIBUTING TO THE IDEA

Name: David Alessio

Signature: 

Date: 5/8/02

Name:

Signature: _____

Date: _____

Name:

Signature: _____

Date: _____

Name:

Signature: _____

Date: _____

WITNESS: I have read and understood the idea described above:

Name: 

Signature: _____

Date: _____

TO BE COMPLETED BY INTELLECTUAL PROPERTY LIAISON:

Received by:

Name: _____

Signature: _____

Date: _____